

AD 689758

HYBRID THICK AND THIN FILM MICROCIRCUITS

A Report Bibliography

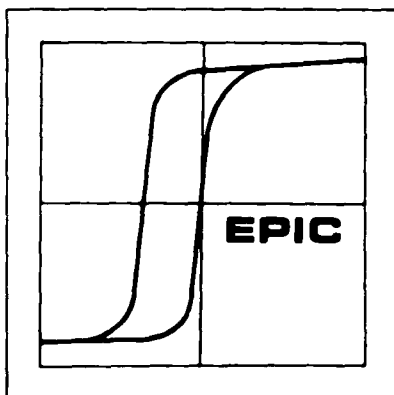
by

John T. Milek

DDC

JUL 14 1969

March 11, 1969



ELECTRONIC
PROPERTIES
INFORMATION
CENTER

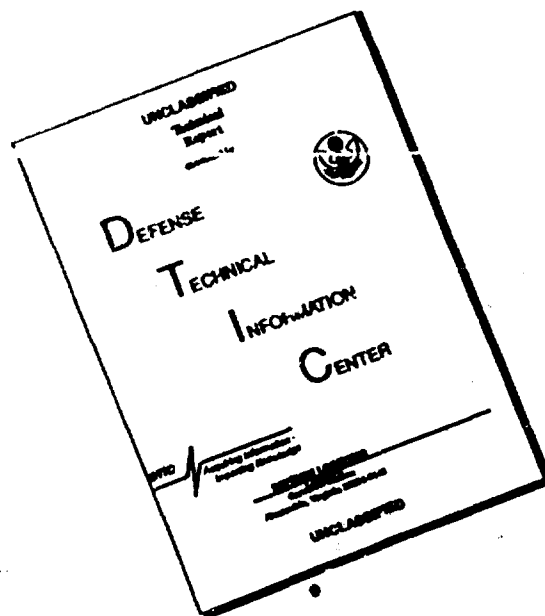
HUGHES

HUGHES AIRCRAFT COMPANY
CULVER CITY, CALIFORNIA

THIS DOCUMENT IS UNCLASSIFIED
for public release and sale; its
distribution is unlimited

Report by the
CLEARINGHOUSE
for Federal Government Technical
Information Springfield, Va. 22151

DISCLAIMER NOTICE



THIS DOCUMENT IS BEST QUALITY AVAILABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

INTRODUCTION

This report bibliography has been prepared in response to a request for information on hybrid thick film circuits. In view of the fact that this area of hybrids is growing as well as the thin film hybrid area, it was decided to compile on both types and make the bibliography more useful.

The report bibliography covers the time span from 1966 to the present and is arranged in alphabetic sequence for easy reference checking. A total of 63 references were found in the literature and were selected on the basis of having the subject descriptor "hybrid" in the title. Undoubtedly, additional references on the subject occur in the literature but could not be located immediately because they lacked the term "hybrid" in the title.

ABBE, R.C. The Use of Components in Thick Film Hybrid Systems. WORKSHOP ON THICK FILM HYBRID IC TECHNOLOGY, IEEE, 1968. p. 7-1 to 7-15.

ABERNATHY, J. Active Devices in Hybrid Integrated Circuits. WORKSHOP ON THICK FILM HYBRID IC TECHNOLOGY, 1968. p. 4-1 to 4-14.

Analysis and Corrective Action Recommendations for F-111 B Hybrid Circuits. Mar. 14, 1967. 11 p. IDEP 515.00.04.00-K4-02. Suppl. to Rept. no. IDEP 515.00.04.00-K4-01 dated Mar. 13, 1967, AD 823 425L. (Grumman Aircraft Engineering Corp., Bethpage, N.Y.) AD 823 425L

BARRACK, C.M. Development of a Hybrid Microcircuit Fabrication Facility. MICROELECTRONICS SYMP., 1968. p. D5/1-D5/5.

BERGENS, D.M. A Hybrid Microelectronic A to D Converter. 2nd NASA MICROELECTRONIC SYMP., PROC., June 1967. p. 221-228. (Goddard Space Flight Center. Jet Propulsion Lab., Calif.) N67 31582.

Big Role Seen for Hybrid ICs. EEE, v. 16, May 1968. p. 22-24.

BOWER, F. Hybrid IC Assembly and Packaging. WORKSHOP ON THICK FILM HYBRID IC TECHNOLOGY, IEEE, 1968. p. 8-1 to 8-5.

BURKS, D. Hybrid Linear Integrated Circuits. ELECTRONICS WORLD, v. 80, July 1968. p. 42-44.

COCHAIN, R. Plastic Molded Transistor for Hybrid Integrated Circuits. Working Out and Reliability. L'ONDE ELECTRIQUE, v. 47, nos. 480-481, Mar.-Apr. 1967. p. 349-357.

DALE, B. The Application of Beam Lead Devices to Hybrid Microcircuits. ELECTRONIC COMPONENTS CONF., PROC., 1968. p. 84-97.

DAVIS, E.M. A Flexible Digital and Analogue Hybrid Integrated Circuit Technology. In MICROMINIATURIZATION IN AUTOMATIC CONTROL EQUIPMENT AND IN DIGITAL COMPUTERS. (Proc. of the IFAC/IFIP Symposium, Munich, 1965) p. 383-395.

DIETCH, H.E. Manufacturing Equipment for Large Volume Production of Hybrid IC's. WORKSHOP ON THICK FILM HYBRID IC TECHNOLOGY, IEEE, 1968. p. 3-1 to 3-9.

Directory of Hybrid IC Producers. EEE, v. 16, May 1968. p. 51-59.

FRANKEL, H.C. Thin-Film Hybrid Microcircuit Design and Layout. Tech. Rept. Sept. 1967. 53 p. AD 673 117. (Army Electronics Command, Fort Monmouth, N.J.)

Giving IC OP Amps a Powerful Boost (Thick-Film Hybrid Device That's Short-Circuit Proof can Increase an Amplifier's Output as much as 40 Times. ELECTRONICS, v. 41, no. 3, Feb. 5, 1968. p. 154-156.

GOLLESTEIN, J. Hybrid Microcircuit Technology. WORKSHOP IN THICK FILM HYBRID IC TECHNOLOGY, IEEE, 1968. p. 2-1 to 2-7.

GREENWELL, A.W. Diplog - A New Range of Thin-Film Hybrid Integrated Circuits. INDUSTRIAL ELECTRONICS, v. 6, no. 4, Apr. 1968. p. 143-148.

HAMER, D.W. Ceramic Capacitors for Hybrid Integrated Circuits. SYMP. ON HYBRID MICROELECTRONICS, 1968. p. 99-109.

HAMER, D.W. Ceramic Capacitors for Hybrid Integrated Circuits. IEEE SPECTRUM, v. 6, no. 1, Jan. 1969. p. 79-84.

HAYES, W. How to Design Thick Film Hybrid ICs. ELECTRONIC ENGINEER, v. 26, no. 8, Aug. 1967. p. 70-74.

HIRSCHFIELD, P. et al. The Design and Fabrication of a Thin Film Hybrid Sub-Audio Active Filter. 6th Annual Microelectronics Symposium, St. Louis, IEEE, 1967. p. D4-1 to D4-8.

HO, R.K. Deposited Film Hybrid Circuits - Process and Materials. INSULATION, v. 12, Oct. 1966. p. 37-42.

Hybrid Circuits Make Their Bow in Consumer Goods-A TV Tuner. PRODUCT ENGINEERING, v. 39, Apr. 22, 1968. p. 74-75.

Hybrid Film Microcircuit Reliability Study for Tape Control Unit. Final Development Rept., 1966. 148 p. AD 483 218. (Sylvania Electric Products, Inc., Waltham, Mass.) X66 21415.

Hybrid IC's Aim at the Consumer Market. ELECTRONICS, v. 40, no. 13, June 26, 1967. p. 163-164.

Hybrid IC Replaces TRIAC. EEE, Aug. 1968. p. 56.

Hybrid Microelectronics. SYMP. ON HYBRID MICROELECTRONICS, 2d, Boston, Mass., 1967. (North Hollywood, Calif., Western Periodicals Co., 1967.)

Hybrid Technology Wins a Foothold. ELECTRONICS, v. 40, no. 16, Aug. 7, 1967. p. 107-113.

Hybrids, Linear ICs Dominate the Scene. ELECTRONIC DESIGN, v. 17, Aug. 15, 1968. p. U82-U84.

Joel Cohen of Crystalonics Speaks Out on Building Your Own Hybrid ICs. EEE, v. 16, Nov. 1968. p. 102-104.

KAREW, J. Hybrid Circuits in Computer Design. EE, v. 25, Sept. 1966. p. 90-98, 100.

KEISTER, F.Z. Design Guide for Thick-Film Hybrid Microcircuits. CERAMIC AGE, v. 84, no. 1, Jan. 1968. p. 51-55.

KEISTER, F.Z. An Introduction to Thick Film Hybrid Microcircuits. Aug. 1966. TM-872. (Hughes Aircraft Company, Culver City, Calif.)

KIRBY, P.L. Complex Hybrid Integrated Circuits. INDUSTRIAL ELECTRONICS, v. 6, no. 2, Feb. 1968. p. 84-87.

KOFORD, J.S. et al. Using A Graphic Data-Processing System to Design Artwork for Manufacturing Hybrid Integrated Circuits. AFIPS CONF. PROC., FALL JOINT COMPUTER CONF., v. 29, 1966. p. 229-246.

LITTL, W.A. et al. Hybrid Integrated-Circuit Digital Phase Shifters. CONF. ON SOLID-STATE CIRCUITS, PHILADELPHIA, 1967. DIGEST OF TECHNICAL PAPERS. New York, Lewis Winner, 1967. p. 58-59.

MANN, R.M. IC Simplifies Hybrid Voltage Regulator. ELECTRONIC PRODUCTS, v. 9, no. 6, Nov. 1966. p. 38, 40-41.

MARSHALL, V.R. Attendance Doubles at Hybrid Microelectronics Symposium. CERAMIC AGE, Dec. 1968. p. 34-36.

MATCOVITCH, T.J. Hybrid Circuit Components and Assemblies - Direct Bonding Processes and Hybrid Circuit Applications. ELECTRONIC PACKAGING AND PRODUCTION, v. 7, no. 11, Nov. 1967. p. 100-108.

MCCORMICK, J.E. Cost Reliability Factors in Hybrid Circuit Packaging. Oct. 1966. 23 p. Presented at the 4th ANNUAL NATL. ELECTRON. PACKAGING/PRODUCTION CONF., New York, June 21, 1966. AD 643 969. (Rome Air Development Center, Griffiss, AFB, N.Y.) N67 20189.

McHALE, P. Increased Yields in Hybrid Thick Film Circuits by Indirect Active Device Attachment. MICROELECTRONICS SYMP., 1968. p. D7/1-D7/6.

MEADOWS, D.M. Computer-Aided Hybrid Microcircuit Mask Design. INTERNATIONAL ELEC. CIRCUIT PACKAGING SYMP., 1968. p. (3/4)11 p.

MELAN, E.H. Hybrid Integrated Circuit Delay Line. INTERNATIONAL ELEC. CIRCUIT PACKAGING SYMP., 1966. p. 7/21-1 to 7/12-13.

MELAN, E.H. Recent Developments in Thick-Film Hybrid Modules. SEMICONDUCTOR PRODUCTS AND SOLID STATE TECHNOLOGY, v. 10, no. 6, June 1967. p. 23-28.

PAWLUK, H. Passive Components for Hybrids. ELECTRONIC ENGINEER, v. 26, no. 10, Oct. 1967. p. 67-71.

POSTLETHWAITE, A.W. Hybrid Thick Film Printed Components-Materials and Processes. WORKSHOP ON THICK FILM HYBRID IC TECHNOLOGY, IEEE, 1968. p. 5-1 to 5-10.

RADEMAKERS, A. A Cheap and Versatile Method for Making Hybrid Integrated Circuits. MICROMINIATURIZATION IN AUTOMATIC CONTROL EQUIPMENT AND IN DIGITAL COMPUTERS. (Proc. of the IFAC/IFIP Symp., Munich, 1965). p. 373-382.

RENN, D.J. Frequency Response of Cermet Resistors for Hybrid Microcircuits. IEEE TRANS. ON BROADCAST AND TELEVISION RECEIVERS, v. BTR-13, no. 3, Nov. 1967. p. 22-26.

RIBEN, A.R. and S.L. SHERMAN. Microbonds for Hybrid Microcircuits. QPR, no. 8, Nov. 1965-Jan. 31, 1966. May 20, 1966. 111 p. AD 633 723. (Hamilton Standard Div., United Aircraft Corp., Broad Brook, Conn) N66-33276.

RIEMER, D.E. Hybrid Medium Scale Integration (MSI). SYMP. ON HYBRID MICROELECTRONICS, 1968. p. 233-243.

ROSE, J. Hybrid Sandwich Saves Space. EDN, v. 12, no. 7, June 1, 1967. p. 74.

ROSE, J. When is a Hybrid a Hybrid? (What is Meant by the Microelectronic Terms Used and How do They Differ?). EDN, v. 12, no. 7, June 1, 1967. p. 22-29.

ROSEBERY, W. Hybrid Microcircuits for Aerospace. ELECTRONICS AND COMMUNICATIONS, v. 15, no. 1, Jan. 1967. p. 38-40.

Screenable Materials for Hybrid Circuits. ELECTRONIC PACKAGING AND PRODUCTION, v. 8, no. 2, Feb. 1968. p. 59-63.

STALLER, J.J. Introduction to Thick Film Hybrid Circuits. WORKSHOP ON THICK FILM HYBRID IC TECHNOLOGY, IEEE, 1968. p. 1-1 to 1-14.

Tantalum's Popularity Grows in Thick-Thin-Film Controversy. EEE, v. 15, no. 3, Mar. 1967. p. 44-50, 55-61.

Thick Film Hybrid Layout Guidelines. ELECTRONIC DESIGN, v. 16, Aug. 1, 1968. p. 30-31.

TOPPER, M.L. Thick Film Hybrid Technology. NATIONAL SAMPE SYMP., 1968. p. II-IC-2, 23 p.

VAN DEN HEUVEL, A.P. Acoustic Microelectronics - A New Hybrid Technology. SYMP. ON HYBRID MICROELECTRONICS, 1968. p. 515-532.

WILLIAMS, K. The New Thick Film Hybrid Integrated Circuit Module for VHF Television Tuners. IEEE TRANS. ON BROADCAST AND TELEVISION RECEIVERS, v. BTR-14, no. 2, July 1968. p. 111-115.

WILLIAMS, K.S. A Plug-In Thick Film Hybrid Circuit Module. SYMP. ON HYBRID MICROELECTRONICS, 1968. p. 497-504.

WOULBROUN, J.M. Hybrid Microcircuits, Why and Where. NATIONAL SAMPE SYMP., 1968. p. II-IC-1, 10 p.

WRIGHT, M.H. A Method of Manufacture of a Thick Film Hybrid Microcircuit. 5th ANNUAL MICROELECTRONICS SYMP., PROC., July 1966. p. 2B-1 to 2B-6.